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**CONTROLLED-RUPTURE DEVICE FOR A STRUCTURE OPERATING IN  
TENSION AND EQUIPMENT USING THE SAME**

The present invention relates to the field of  
5 controlled-rupture devices for structures, particularly  
structures operating in tension.

The present invention may, in particular, find an  
application in the controlled rupture of ties or  
10 supports for holding systems, when these need to be  
released.

More specifically still, the present invention  
preferably applies to the field of assemblies  
15 comprising systems which are highly sensitive to  
mechanical stress. Thus, the present invention may in  
particular find an application in the field of  
aerospace, for example as a support designed to perform  
the controlled release of small-sized satellites.

20 Numerous devices for cutting ties, cables or the like  
have already been proposed.

In particular, numerous rupture devices based on  
25 detonating cords have already been proposed.

On this point, reference may be made, for example, to  
documents FR-A-2 495 991, FR-A-2 492 336,  
FR-A-2 364 746, FR-A-2 464 778 and EP-A-55165.

30 These known devices are still not satisfactory,  
however. In particular, they generate not insignificant  
shocks in the structures cut and their environment.  
Furthermore, they lead to pollution which is  
35 unacceptable in certain applications.

Numerous cutting devices comprising a cutter and an  
element such as a pyrotechnic generator designed to  
move the cutter against the structure to be ruptured in

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order to rupture the latter through the penetration of the cutter into the material of the structure and thus reduction in the thickness thereof have also been proposed.

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On this point, reference may be made for example to documents FR-A-2 319 823, FR-A-2 456 585, FR-A-2 704 466 and DE-A-29809585.

10 However, hitherto, the devices of this type have still not been satisfactory either. They also lead to not insignificant shocks and to risks of pollution following the escape of the gases originating from the pyrotechnic generator.

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Solutions based on expanding pyrotechnic tubes filled with explosive and placed against the structure to be ruptured, near to a line of weakness formed therein, have also been proposed.

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On this point, reference may be made for example to document FR-A-2 619 738.

25 This solution is not entirely satisfactory either. This is because it actually leads to a shock level which is too high for certain applications.

30 In an attempt to improve the situation, present-day studies are tending toward the use of a damper coupled to the cutting device in order to limit the level of mechanical stress applied to the equipment that is to be released.

35 It is an object of the present invention to propose a new device designed to allow the rupture of a structure forming a tie operating in tension and holding a system, which device is designed to limit the mechanical stress applied to the system at the time of